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ALGORITHMS-2: (GATE 2022) - REPORTS

OVERALL ANALYSIS COMPARISON REPORT **SOLUTION REPORT**

ALL(17) CORRECT(8) INCORRECT(5) SKIPPED(4)

Q. 11

FAQ

Solution Video

Have any Doubt ?



String 1 $\rightarrow a a b b c p q r q p$

String 2 $\rightarrow s a b a b t q c p t s p q$

Find the maximum length of the longest common subsequence.

A 4

B 6

Your answer is Correct

Solution :

(b)

String 1 $\rightarrow a a b b c p q r q p$

String 2 $\rightarrow s a b a b t q c p t s p q$

		a	a	b	b	c	p	q	q	p
	0	0	0	0	0	0	0	0	0	0
a	0	1	1	1	1	1	1	1	1	1
b	0	1	1	2	2	2	2	2	2	2
a	0	1	2	2	2	2	2	2	2	2
b	0	1	2	3	3	3	3	3	3	3
q	0	1	2	3	3	3	3	4	4	4
c	0	1	2	3	3	4	4	4	4	4
p	0	1	2	3	3	4	5	5	5	5
p	0	1	2	3	3	4	5	5	5	6
q	0	1	2	3	3	4	5	6	6	6

Maximum length = 6

$\begin{bmatrix} a a b c p q \\ a a b c p p \\ a b b c p q \\ a b b c q p \end{bmatrix} \rightarrow$ possible 6 - length strings.

C 7

D 5

QUESTION ANALYTICS



Q. 12

Solution Video

Have any Doubt ?



Which of the following hash functions can be considered as the best one?

- (a) $(9 \times (\text{key} \bmod 10)) \bmod 10$ (b) $(7^{\text{key} \bmod 10}) \bmod 10$
 (c) $(23^{\text{key} \bmod 10}) \bmod 10$ (d) $(10^{\text{key} \bmod 10}) \bmod 10$

[Note: There are a total of 10 slots in the hash table with open addressing implemented]

A a

Correct Option

Solution :

(a)

A good hash function always tries to distribute the keys uniformly in the hash table.

(d) Targets only location 0.

(c) Targets location 3, 9, 7, 1.

(b) Targets location 7, 9, 3, 1.

(a) Targets all the locations.

B b

C c

Your answer is IN-CORRECT

D d

QUESTION ANALYTICS



Match the following:

[Let G be the graph with V vertices and E edges]

[Time complexities of implementing Dijkstra's algorithm using heap data structure]

- A. $O(V)$ (i) Build min heap of vertices
 B. $O(V \log V)$ (ii) Extracting minimum value weighted vertex
 C. $O(E \log V)$ (iii) Edge update in the min heap

A \rightarrow (ii), B \rightarrow (i), C \rightarrow (iii)

B \rightarrow (i), B \rightarrow (ii), C \rightarrow (iii)

Your answer is Correct

Solution :

(b)

$O(V) \rightarrow$ Time taken to build the vertices min heap.

$O(V \log V) \rightarrow$ Extract minimum vertex and heapify.

$O(E \log V) \rightarrow$ For each updates have to be made in the min heap before next extraction.

C \rightarrow (i), B \rightarrow (iii), C \rightarrow (ii)

D None of these

QUESTION ANALYTICS

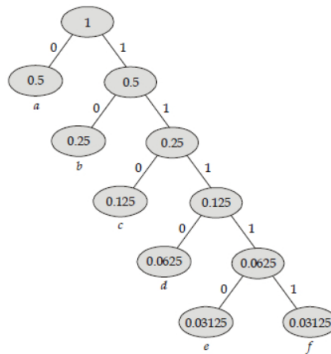
+

Consider the letters a, b, c, d, e and f having probability 0.5, 0.25, 0.125, 0.0625, 0.03125 and 0.03125 respectively. The number of bits per character using Huffman coding is _____. (Upto 1 decimal place)

1.9 [1.9 - 2.0]

Your answer is Correct 1.9

Solution :
 1.9 [1.9 - 2.0]



Codes:

a = 0, b = 10, c = 110

d = 1110, e = 11110, f = 11111

Average length = $0.5 \times 1 + 0.25 \times 2 + 0.125 \times 3 + 0.0625 \times 4 + 0.03125 \times 5 + 0.03125 \times 5$
 = 1.9375

QUESTION ANALYTICS

+

Following items are given with their corresponding weights and profits. Knapsack capacity = 100 kg
 [Partial items are not allowed]

Items	Weight (in kgs)	Profits
1	50	600
2	35	500
3	30	450
4	40	600
5	20	300
6	10	150
7	25	160
8	15	400

Find the maximum number of items whose combined weight equal the Knapsack capacity.

5

Correct Option

Solution :
5

$$\begin{aligned}50 + 35 + 15 &= 100 \\50 + 30 + 20 &= 100 \\50 + 40 + 10 &= 100 \\50 + 25 + 15 + 10 &= 100 \\35 + 40 + 25 &= 100 \\35 + 30 + 10 + 25 &= 100 \\35 + 40 + 10 + 15 &= 100 \\35 + 30 + 20 + 15 &= 100 \\30 + 40 + 20 + 10 &= 100 \\40 + 20 + 25 + 15 &= 100 \\30 + 20 + 10 + 25 + 15 &= 100\end{aligned}$$

QUESTION ANALYTICS

Q. 16

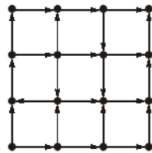
FAQ

Solution Video

Have any Doubt ?



Consider the following graph:



Which of the following statements are false?

A There is no cycle in the above graph.

Your option is Correct

B There are exactly 3 back edges for a given DFS tree in the graph.

Your option is Correct

C There is atleast one strongly connected component present in the graph.

D The graph has a topological sort.

Your option is Correct

YOUR ANSWER - a,b,d

CORRECT ANSWER - a,b,d

STATUS - ✓

Solution :

(a, b, d)

• Cycle present in the graph.

• There is 1 back edge present which belongs to the only cycle present in the graph. The DFS tree starts with the bottom left most node and results in that particular back edge.

• Since graph has cycle, topological order is not possible.

QUESTION ANALYTICS

Q. 17

FAQ

Solution Video

Have any Doubt ?



Min heap tree can be constructed in 2 ways for a given sequence of elements:

Method 1: Insert element and perform heapify one after the other.

Method 2: Insert all the elements in one go and then perform all the heapify operations.

Based on these two methods for creating min heap, select the correct options from the following:

A Both the methods will create exactly same min heap tree for all possible input sequence of elements.

Your answer is IN-CORRECT

B Both the methods may create different min heap tree for some input sequence of elements.

Correct Option

C Method 1 will take $O(n \log n)$ time to create the min heap tree.

Your option is Correct

D Method 2 will take $O(n)$ time to create the min heap tree.

Your option is Correct

YOUR ANSWER - a,c,d

CORRECT ANSWER - b,c,d

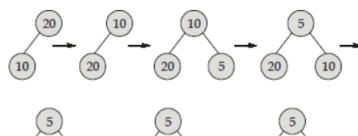
STATUS - ✗

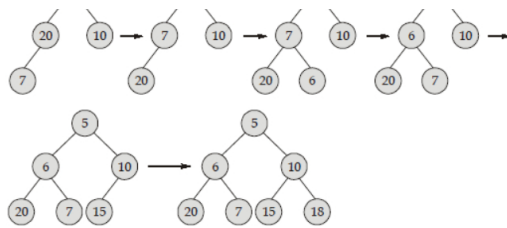
Solution :

(b, c, d)

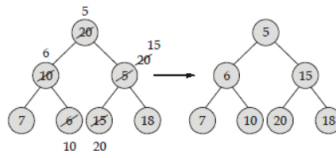
Assume the following sequence: 20, 10, 5, 7, 6, 15, 18

Method 1:





Method 2:



QUESTION ANALYTICS

